CLAIMS

1. A method for data transmission over an optical network, the method comprising:

collecting a plurality of services data to be transmitted in at least one service collection unit;

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processing the services in their original protocols into packets; and

converting the services into optical signals on an optical fiber for transmission into a metro network; and

sorting the services from a plurality of packets according to service type in an aggregator, coupled for optical communication to the service collection units; and

aggregating like services for transmission over a compatible transport network.

2. The method according to claim 1, further comprising:

receiving aggregated services in their original protocols in an aggregator;

sorting or de-multiplexing the services according to end destination;

processing the services into packets according to destination;

loading the packets onto an optical fiber for transmission to a more local network; and

unloading the packets from the optical carrier frames in a service collection unit;

switching the packets to their local service ports;

de-packing the packets to each service's original format; and

sending each service to an appropriate media.

3. The method according to claim 2, further comprising the step of:

inserting the processed packets into transmission frames, before said step of loading;

and wherein said step of loading includes:

loading the transmission frames onto an optical fiber for transmission.

4. The method according to claim 1, wherein the step of collecting includes receiving services as an incoming bit stream through a service interface in the services' original protocols.

5. The method according to claim 1, wherein the step of processing includes:

segmenting an incoming bit stream of services data;

adding a tag to a header of each segment, each tag including connection identification between a source and a destination end-point of the bit stream;

encapsulating said tagged segment into a Point-to-Point Protocol (PPP) packet in a frame; and

transmitting the PPP packet over a service collection unit's optical transceiver.

6. The method according to claim 5, further comprising the step of mapping the encapsulated packet into a transmission frame for transmission over an optical fiber, after the step of encapsulating.

7. The method according to claim 6, wherein the step of mapping includes mapping the encapsulated packet into an PoS (Packet over SONET/SDH) frame.

8. The method according to claim 7, further comprising the step of switching frames between a plurality of service collection unit's optical transceivers by means of a stream switch.

9. The method according to claim 6, wherein the encapsulated segment is scrambled, before mapping onto transmission frames.

10. The method according to claim 5, wherein the step of transmitting includes WDM multiplexing of optical signals from optical tranceivers with different specific wavelengths to be transmitted.

11. The method according to claim 5, wherein the step of segmenting includes segmenting the bit stream into variable-length segments.

12. The method according to claim 5, further comprising the step of switching the tagged segment to an appropriate Trunk by a packet switch before said step of encapsulating.

13. The method according to claim 5, wherein the step of encapsulating includes encapsulating the tagged segment into a Point-to-Point Protocol (PPP) packet in a High bit rate Digital Link Control (HDLC)-like frame.

14. The method according to claim 1, wherein the step of sorting includes:

switching services of a same type to a same aggregation sub-module.

15. The method according to claim 6, wherein the step of sorting includes:

receiving incoming optical signals from service collection units in an aggregator's optical transceiver; and

switching said incoming optical signals by means of a stream switch to a transmission framer for removing said PPP packets from said transmission frames.

16. The method according to claim 15, wherein the step of sorting further includes:

reading tags on said removed packets; and

switching said packets to an Aggregator module, according to the connection identification indicated in said packet's tag.

17. The method according to claim 16, further comprising the steps of:

removing the tag from each packet to provide a plurality of segments of various services;

reassembling each service to its original bit stream; and

aggregating like services together for transmission over an appropriate network.

18. The method according to claim 17, wherein the step of aggregating includes multiplexing several services onto a single fiber over different wavelengths.

19. The method according to claim 17, wherein the step of aggregating includes aggregating services of a single service type directly onto an optical fiber in an appropriate network.

20. The method according to claim 10, wherein the step of sorting includes:

de-multiplexing incoming optical signals; and

sending said de-multiplexed signals to an aggregator's optical transceiver.

21. The method according to claim 1, further comprising the steps of:

receiving aggregated services from at least two networks in an aggregator, each service in its own protocol and at its own bit rate;

sorting the services, according to network destination;

processing the services in their original protocols into packets;

adding a connection identification tag to each packet;

switching each packet to an appropriate trunk optical fiber for transmission to a service collection unit.

22. The method according to claim 21, including inserting said packets into a transmission frame before the step of transmitting.

23. The method according to claim 21, wherein said step of sorting includes sorting by de-multiplexing.

24. The method according to claim 21, wherein said step of sorting includes separation of aggregated services.

25. The method according to claim 21, further including the steps of:

receiving incoming packets from a plurality of trunk ports in a service collection unit optical transceiver;

de-capsulating each encapsulated PPP packet;

switching each packet to a local network according to a tag on the packet;

stripping off said tag;

reassembling all segments of each service to their original bit stream; and

transmitting each service to a final destination over a local network appropriate for that service.

26. The method according to claim 25, further including the step of de-multiplexing said packets before the step of receiving.

27. The method according to claim 25, wherein said step of receiving includes:

receiving incoming transmission frames from a plurality of trunk ports in a service collection unit;

switching said incoming transmission frames from an optical transceiver to transmission framers; and

de-packing the transmission frames.

28. The method according to claim 25, further including the step of unscrambling the packets before said step of de-encapsulating.

29. The method according to claim 25, wherein said step of transmitting includes:

passing said services to an interface transceiver in a service card; and

sending said services through an appropriate destination service port in said service collection unit, for transmittal to the final destination